REMARKS

Summary of the Office Action

Claims 1-3 are rejected under 35 U.S.C. § 102(e) as being anticipated by Takahashi et al. (U.S. Pat. No. 6,265,827).

Claims 1-3 are rejected under 35 U.S.C. § 102(e) as being anticipated by Yoshida et al. (U.S. Pat. No. 5,936,350).

Claims 1-3 are rejected under 35 U.S.C. § 102(e) as being anticipated by Newell et al. (U.S. Pat. No. 6,166,495).

Claims 1-3 are rejected under 35 U.S.C. § 102(e) as being anticipated by Russell et al. (U.S. Pat. No. 5,394,057).

Claims 1-3 are rejected under 35 U.S.C. § 102(e) as being anticipated by Newell et al. (U.S. Pat. No. 6,392,346).

Claims 4-8 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Takahashi et al.

Claims 4-8 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Yoshida et al.

Claims 4-8 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Newell et al. '495.

Claims 4-8 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Russell et al.

Claims 4-8 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Newell et al. '346.

Claims 9-16 are objected to.

Claims 17-20 are allowed.

Summary of the Response to the Office Action

Applicants thank the Examiner for indicating that claims 9-16 contain allowable subject matter, and for allowing claims 17-20.

Applicants filed a certified copy of Japanese Application No. 11-180285 in accordance with 35 U.S.C. § 119, on June 23, 2000. A verified translation of the priority document is enclosed herewith.

Applicants have amended the specification to correct minor translation errors.

Claims 1-20 are pending.

All Claims Define Allowable Subject Matter

Claims 1-3 are rejected under 35 U.S.C. § 102(e) as being anticipated by Takahashi et al., Newell et al. '495, and Newell et al. '346. Claims 4-8 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Takahashi et al., Newell et al. '495, and Newell et al. '346, applied individually. All rejections based on Takahashi et al., Newell et al. '495, and Newell et al. '346 have been rendered moot since Applicants have established an earlier date of invention by the submittal of a verified translation of the priority document.

Claims 1-3 are rejected under 35 U.S.C. § 102(e) as being anticipated by Russell et al. Claims 4-8 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Russell et al. Applicants respectfully traverse the rejections as being based on a reference that neither teaches nor suggests the novel and unobvious combination of features recited in claims 1-8.

Claims 1-8 include the features of an arc tube having a discharge space including substantially no mercury, and a pair of electrodes facing each other in the discharge space. Applicants respectfully submit that Russell et al. does not teach or suggest the above claimed features. As described at col. 2, line 68 - col. 3, line 5 of Russell et al., "in most cases, mercury will also be a component of the [arc tube] fill. However, as those skilled in the art know, high intensity discharge *electrodeless* lamps which operate by radio or microwave frequency often contain little or no mercury (essentially mercury free) in the fill or arc tube." (emphasis added). Thus, Russell et al. appears to teach an essentially mercury free fill only for lamps without electrodes. Because Russell et al. fails to disclose at least the above noted features of Applicants' independent claims 1 and 8, it is respectfully submitted that Russell et al. can neither anticipate nor provide a prima facie showing of obviousness with regard to Applicants' independent claims 1 and 8.

At least for the above described reasons, Applicants respectfully request that the rejection of claims 1-3 under 35 U.S.C. § 102(e), and claims 4-8 under 35 U.S.C. § 103(a) be withdrawn.

Claims 1-3 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Yoshida et al. Claims 4-8 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Yoshida et al. Applicants respectfully traverse the rejection under 35 U.S.C. § 102(e) as being based on a reference that fails to teach the novel combination of features recited in claims 1-3.

Referring to col. 1, ll. 45-49, Yoshida apparently is directed to a metal halide headlamp in which a coil is wrapped around an electrode installed in a discharge chamber to prevent the occurrence of cracks in a sealing portion. Referring to Fig. 1, and col. 2, ll. 20-25, Yoshida

teaches the occurrence of cracks in the bulb 2 and changes in the lamp characteristics caused by the accumulation of metal halides on the coils 4 after the lamp 1 is turned on can be prevented by optimally setting the conditions of the electrodes 3, the coils 4, and other parts constituting the metal halide headlamp 1. Applicants respectfully assert that Yoshida does not teach or suggest the feature of an arc tube having a discharge space including substantially no mercury. Accordingly, Applicants respectfully request that the rejection of claims 1-3 under 35 U.S.C. § 102(e), by Yoshida et al., be withdrawn. Applicants further submit that Yoshida et al. is not a proper reference under 35 U.S.C. § 103 in consideration of the common assignee provision of 35 U.S.C. § 103(c). Accordingly, Applicants request that the rejection of claims 4-8 under 35 U.S.C. § 103, by Yoshida et al., be withdrawn. Applicants respectfully submit that all pending claims are in condition for immediate allowance.

Attached hereto is a marked-up version of the changes made by the current amendment. The attached page is captioned "**Version with markings to show changes made**."

CONCLUSION

In view of the foregoing, Applicants respectfully request reconsideration and the timely allowance of the pending claims. Should the Examiner feel that there are any issues outstanding after consideration of this response, the Examiner is invited to contact Applicants' undersigned representative to expedite the prosecution.

If there are any other fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-0310. If a fee is required for an extension of time under 37 C.F.R. 1.136 not accounted for above, such an extension is requested and the fee should also be charged to our Deposit Account.

Respectfully submitted,

MORGAN, LEWIS & BOCKIUS LLP

Dated: May 13, 2003 By: _____

Peter J. Sistare
Reg. No. 48,183

CUSTOMER NO. 009629
MORGAN, LEWIS & BOCKIUS LLP
1111 Pennsylvania Avenue, N.W.
Washington, D.C. 20004
202.739.3000

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION

The paragraph at page 12, ll. 14-24 has been amended as follows:

With metal halide lamp arc tubes for vehicle use, arc diameter indicates the range ~~[up]~~ **down** to 20% of maximum luminance, and an arc diameter of 1.1 mm is preferred. When the arc diameter is 1.1 mm, which is smaller than an internal diameter of 1.7 mm of the arc tube at the region between the ends of the electrodes 3, a heat dissipation region can no longer be guaranteed. The heat dissipation region causes temperature to fall from approximately 2500°C at the high temperature region at the periphery of the arc to approximately 1000°C at the quartz glass tube wall. The extent of electrical ionization is therefore reduced due to the arc being cooled by the tube wall, which causes instability and makes it easy for the arc to disappear. The quartz glass tube wall is therefore subjected to overheating. In addition, a chemical reaction may take place between the metal halides and the quartz glass tube wall, and evaporation of the silica may cause devitrification or melting of the arc tube itself.

The paragraph at page 13, line 20 to page 14, line 2 has been amended as follows:

By selecting **metal composing the** low melting point metal halides with ionizing potentials in a range of 5.5eV to 6.5eV, highly efficient emission of light is not hindered from the start of sodium and scandium emissions due to the increased temperature of the arc tube, and emissions from **metals composing** the low melting point metal halides can be attenuated. This is because a phenomena is utilized where, when a plurality of gas atoms or molecules with

differing ionizing potentials are present, the molecules or atoms with the smaller ionizing potentials are ionized or recombined, or energized and recombined, and thermal energy of the arc plasma is converted to and emitted as light, whereas it is relatively difficult to make atoms or molecules with a high ionizing potential emit light.

The paragraph at page 14, ll. 3-6 has been amended as follows:

It is preferable for the ionizing potential of **metal composing** the low melting point metal halide to be between that of sodium (5.14eV) and scandium (6.54eV) in order to emit a certain amount of light when the arc tube 1 is operating in a stable manner, with 5.5 to 6.5eV being preferred. Either of indium (5.79eV) or gallium (6.00eV) would satisfy this condition.

The paragraph at page 15, ll. 15-19 has been amended as follows:

When the mole ratio of the low melting point metal halide to the scandium halide is less than 0.5, the start-up characteristics and color of light emitted do not improve sufficiently. When this mole ratio is greater than 3.0, light emitted by **metals comprising** the low melting point metal halide becomes predominant, causing the light emitted to deviate from the desired color range and causing the visible light emitting efficiency to noticeably drop.

The last paragraph on page 20 has been amended as follows:

FIG. 10 is a longitudinal side view of a headlamp 11 in which the metal halide lamp 10 of the invention is employed as a light source for the vehicle headlamp 11 such as used in an

automobile. The headlamp 11 lights up the path in front of the vehicle by reflecting light from the metal halide lamp 10 by a reflector 12 located on a horizontal axis Z so that the reflected light projects towards the front and passes through an outer lens 13. An inner lens 14 can be used to ~~[bend]~~ **refract** light from the reflector 12 downwards and for diffusing this light to the left and right. When the inner lens 14 is in the substantially vertical position, the light distribution is suitable for passing other vehicles (low beam mode), with the area close to the front of the vehicle primarily being lit up. When the inner lens 14 is rotated upwards so as to be substantially horizontal, areas at a distance from the front of the vehicle can be lit up (high beam mode).